

Experimental study of streaming in ultrasonic levitators, Eugene H. Trinh (Jet Propulsion Laboratory, California Institute of Technology, MS 183-401, 4800 Oak Grove Drive, Pasadena, CA 91 109)

Flow visualization studies of streaming flow fields in 20 and 37 kHz ultrasonic levitators have revealed patterns of circulation of increasing complexity as the sound pressure level is increased. At relatively modest sound pressure level on the order of 145 dB (re. 0.0002 μ Bar), a straightforward superposition of the background circulation induced by the levitator components and enclosure and of the outer streaming flow associated with a levitated sample, provides a clear explanation for the observed flow field morphology. At the sound pressure level, above about 155 dB, the resulting flow morphology cannot be rationalized so easily because the initially laminar background field becomes disordered with imbedded eddies. When a levitated sample is locally heated, the resulting pattern is complicated even at low sound pressure level. A qualitative interpretation of this evidence in terms of the existing boundary layer streaming theory is presented. [Work supported by NASA.]

Technical Area Physical Acoustics

(PACS) Subject Classification Numbers: 43.25.UV, 43.25.Yw

Telephone number: (818) 3547125 Fax: (81 8) 3935039

Send notice to: E.H. Trinh

Special facility: VCR and 25 inch monitor